

< Specifications (Precautions and Prohibitions) >

● Precaution for circuit design

- 1) The products are designed and produced for application in ordinary electronic equipment (AV equipment, OA equipment, telecommunication equipment, home appliances, amusement equipment, etc.).
 If the products are to be used in devices requiring extremely high reliability (medical equipment, transport equipment, aircraft/spacecraft, nuclear power controllers, fuel controllers, car equipment including car accessories, safety devices, etc.) and whose malfunction or operational error may endanger human life and sufficient fail-safe measures, please consult with the ROHM sales staff in advance. If product malfunctions may result in serious damage, including that to human life, sufficient fail-safe measures must be taken, including the following:
 - [a] Installation of protection circuits or other protective devices to improve system safety
 - [b] Installation of redundant circuits in the case of single-circuit failure
- 2) The products are designed for use in a standard environment and not in any special environments. Application of the products in a special environment can deteriorate product performance. Accordingly, verification and confirmation of product performance, prior to use, is recommended if used under the following conditions:
 - [a] Use in various types of liquid, including water, oils, chemicals, and organic solvents
 - [b] Use outdoors where the products are exposed to direct sunlight, or in dusty places
 - [c] Use in places where the products are exposed to sea winds or corrosive gases, including Cl_2 , H_2S , NH_3 , SO_2 , and NO_2
 - [d] Use in places where the products are exposed to static electricity or electromagnetic waves
 - [e] Use in proximity to heat-producing components, plastic cords, or other flammable items
 - [f] Use involving sealing or coating the products with resin or other coating materials
 - [g] Use involving unclean solder or use of water or water-soluble cleaning agents for cleaning after soldering
 - [h] Use of the products in places subject to dew condensation
- 3) As surface plating material, Ag is used for plating electrode terminal of this LED product.
 In case gum material such as non-metallic seal which contains sulfur is used to equipment or instrument, there is possibly that corrosive gas is generated and cause deterioration in electrode characteristics or functional disorder in storage and use of the product.
 Regarding atmosphere where the LED product is stored and used, at the time of design please consider the influence of gas generated by surrounding parts and give full evaluation.
- 4) The products are not radiation resistant.
- 5) The Company is not responsible for any problems resulting from use of the products under conditions not recommended herein.
- 6) The Company should be notified of any product safety issues. Moreover, product safety issues should be periodically monitored by the customer.
- 7) De-rate Power Dissipation (Pd) depending on Ambient temperature (Ta).
 When used in sealed area, confirm the actual ambient temperature.
- 8) Confirm that operation temperature is within the specified range described in product specification.
- 9) Failure induced under deviant condition from what defined in the product specification can not be guaranteed.
- 10) When product safety related problems arises, please immediately inform to ROHM, and consider technical counter measure.

DESIGN	CHECK	APPROVAL	DATE:Aug./10/2011	SPECIFICATION No. : TENTATIVE (20110810)
<i>T.Nakagawa</i>	<i>M.Kobayakawa</i>	<i>S.Isokawa</i>	REV. 001	ROHM Co.,Ltd.

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● Precaution for Mounting / Circuit board design

When a highly active halogenous (chlorine, bromine, etc.) flux is used, the remainder of flux may negatively affect product performance and reliability.

● Precautions Regarding Application Examples and External Circuits

- 1) If change is made to the constant of an external circuit, allow a sufficient margin due to variations of the characteristics of the products and external components, including transient characteristics, as well as static characteristics.
- 2) The application examples, their constants, and other types of information contained herein are applicable only when the products are used in accordance with standard methods. Therefore, if mass production is intended, sufficient consideration to external conditions must be made.

● Precautions for Electrostatic

This product is Electrostatic sensitive product, which may be damaged due to Electrostatic discharge. Please take proper caution during manufacturing and storing so that voltage exceeding Product maximum rating won't be applied to products.
 Please take special care under dry condition (e.g. Grounding of human body / equipment / solder iron, isolation from charged objects, setting of Ionizer, friction prevention and temperature / humidity control).

● Precautions for product label

QR code printed on ROHM product label is only for internal use, and please do not use at customer site. It might contain an internal part number that is inconsistent with a product part number.

● Precautions for disposition

When disposing products please dispose them properly with an industry waste company.

● Precautions for Foreign exchange and Foreign trade act

Since conceded goods have not been determined to be fallen under controlled goods prescribed by Foreign Exchange and Foreign Trade act or not, please consult with ROHM in case of export.

● Prohibitions Regarding Industrial Property

- 1) These Specifications contain information related to the ROHM industrial property. Any use of them other than pertaining to the usage of appropriate products is not permitted. Duplication of these Specifications and its disclosure to a third party without the Company's permission are prohibited.
- 2) Information and data on products, including application examples, contained in these specifications are simply for reference; the Company does not guarantee any industrial property rights, intellectual property rights, or any other rights of a third party regarding this information or data. Accordingly, the Company does not bear any responsibility for:
 - [a] infringement of the intellectual property rights of a third party
 - [b] any problems incurred by the use of the products listed herein
- 3) The Company prohibits the purchaser of its products to exercise or use the intellectual property rights, industrial property rights, or any other rights that either belong to or are controlled by the Company, other than the right to use, sell, or dispose of the products.

< Specifications (Precautions and Prohibitions) >

● **Precautions for Storage / Transportation**

- 1) Product performance and soldered connections may deteriorate if the products are stored in the following places:
 - [a] Where the products are exposed to sea winds or corrosive gases, including Cl₂, H₂S, NH₃, SO₂, and NO₂
 - [b] Where the temperature or humidity exceeds those recommended by the Company
(Temperature=5~30°C, Humidity=Max.60%)
 - [c] Storage in direct sunshine or condensation
 - [d] Storage in high Electrostatic
- 2) Even under ROHM recommended storage condition, solderability of products over 1 year old may be degraded.
- 3) Store / transport cartons in the correct direction, which is indicated on a carton as a symbol.
Otherwise bent leads may occur due to excessive stress applied when dropping of a carton.

● **Other Matters**

- 1) Please sign these Specifications and return one copy to the Company.
If a copy is not returned within three months after the issued date specified on the front page of these Specifications, the Company will consider the Specifications accepted.
- 2) If any matter related to these Specifications needs to be clarified, discussions shall be held promptly between the two parties concerned to determine the issue.

1. CONSTRUCTION White LED constructed with InGaN encapsulated within special epoxy that purifies the emitted color.

2. USAGE Power source for display unit.

3. DIMENSIONS See Figure.1

4. ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Power Dissipation	P D	120mW
Forward Current	I F	30mA
Peak Forward Current	I F P	100mA (Notes 1)
Reverse Voltage	V R	5V
Operating Temperature	Topr	−40°C ~ + 85°C
Storage Temperature	Tstg	−40°C ~ +100°C
(Notes1 Duty 1/10 1kHz)		

5. ELECTRO—OPTICAL CHARACTERISTICS (Ta=25°C)

DISCRIPTION	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNITS
Forward Voltage	VF	IF=20mA * ¹	—	3.2	4.0	V
Reverse Current	IR	VR=5V	—	—	10	μ A
Luminous Intensity	IV	IF=20mA * ²	680	1850	3300	mcd
Chromaticity Coordinates	x	IF=20mA * ²	—	0.31	—	—
	y	IF=20mA * ²	—	0.31	—	—

*¹ Pulse duration : 1msec *² Pulse duration : 10msec

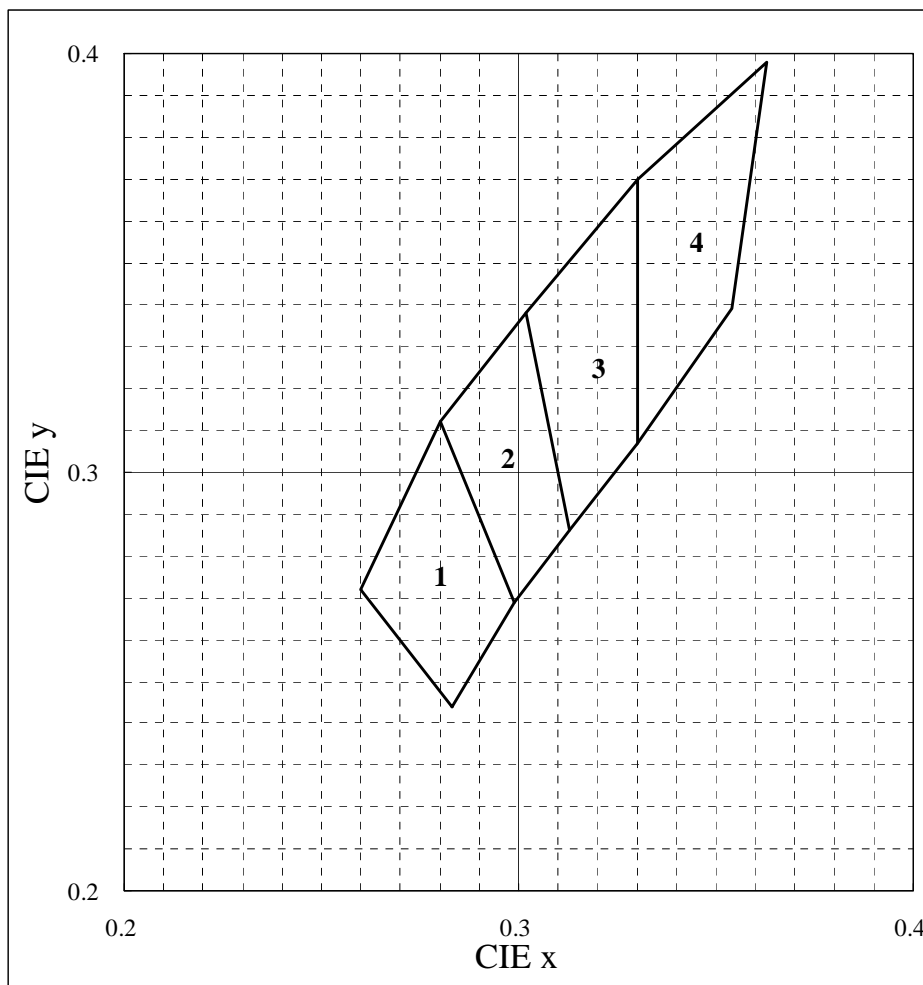
6. LUMINOUS CLASSIFICATION (Ta=25°C, IF=20mA)

SYMBOL	LUMINOUS CLASSIFICATION RANGE
“XM”	6 8 0 ~ 1 0 0 0 mcd
“XN”	1 0 0 0 ~ 1 5 0 0 mcd
“XP”	1 5 0 0 ~ 2 2 0 0 mcd
“XQ”	2 2 0 0 ~ 3 3 0 0 mcd

Measurement tolerance : ±10%

If rank shift occur, we may ask for re-approval of new rank when necessary.

7. CHROMATICITY DIAGRAM



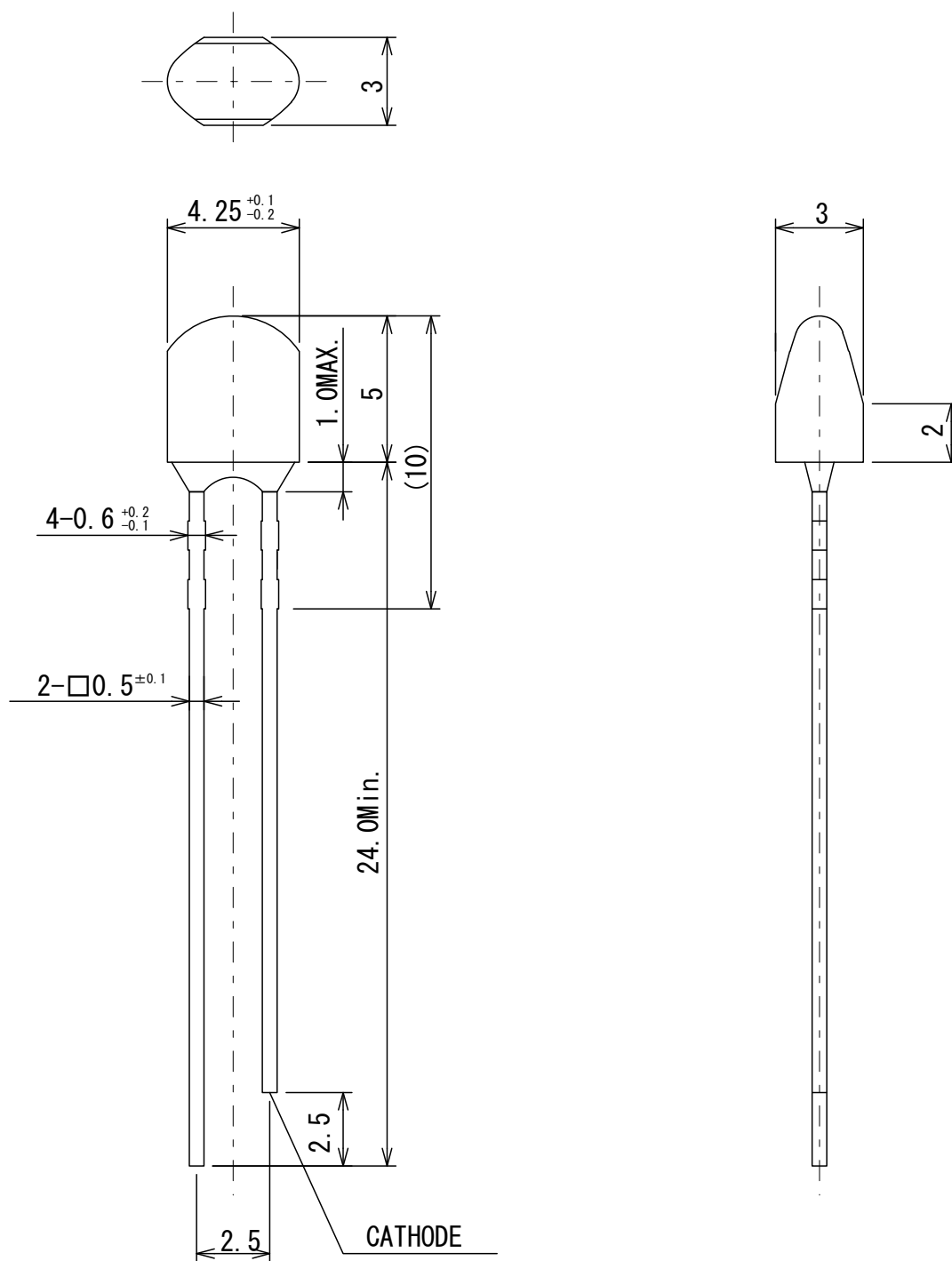
• CHROMATICITY COORDIMATES (Ta=25°C, IF=20mA)

1		2		3		4	
x	y	x	y	x	y	x	y
0.283	0.244	0.280	0.312	0.302	0.338	0.330	0.307
0.299	0.269	0.302	0.338	0.330	0.370	0.354	0.339
0.280	0.312	0.313	0.286	0.330	0.307	0.363	0.398
0.260	0.272	0.299	0.269	0.313	0.286	0.330	0.370

Measurement tolerance : ± 0.02

8. PRODUCT WEIGHT Product weight per piece, approx 0.17gm.

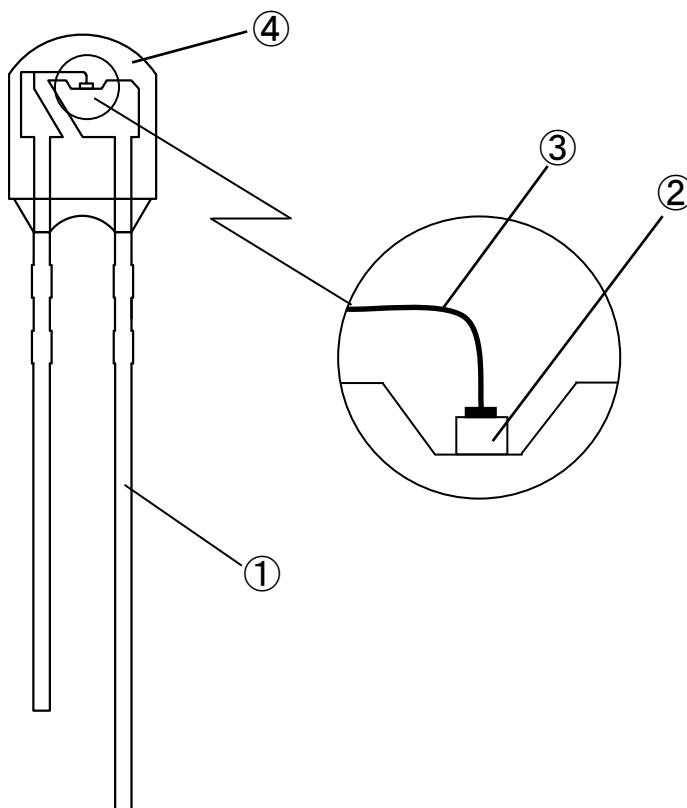
【Figure.1 DIMENSIONS】



Tolerance : ± 0.2

() : Reference

(Unit : mm)

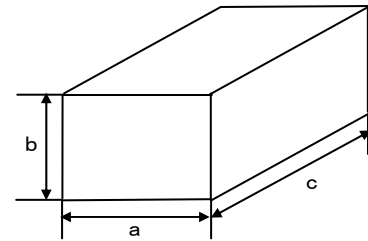
【STRUCTURE・MATERIAL】


No.	APPELLATION	MATERIAL
1	Lead Frame Lead	Iron Copper + Silver Plating Solder Dip
2	LED Chip	InGaN
3	Bonding Wire	Gold
4	Resin	Lens part : Epoxy Resin Parabola part : Silicone Resin Including Phosphor

【PACKAGING REQUIREMENTS】

1. PACKING

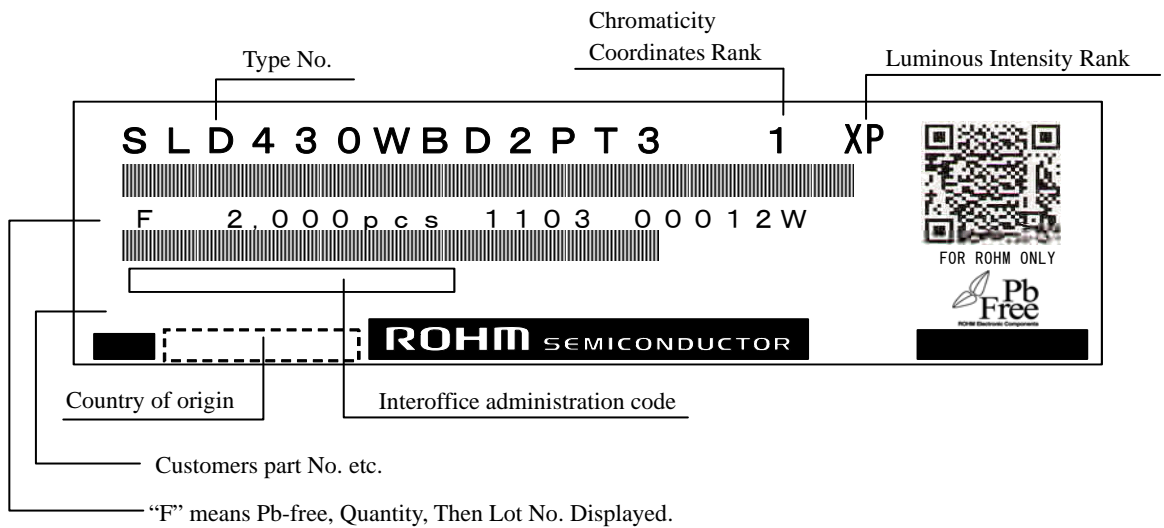
- (1) 500pcs to be packaged in a poly-bag.
- (2) 4 poly-bags to be packaged in a paper box.
 The paper box shall measure 100(a)×70(b)×170(c)mm.




2. MARKING

The following information shall be described on a box label:
 ROHM type number, packaging quantity, luminous intensity rank, lot number etc.

【FORMER LABEL SPECIFICATION】

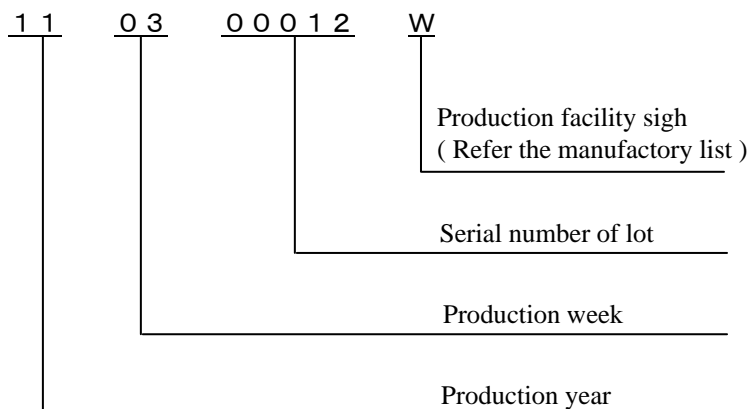


NOTE)  Indicates bar code expressed by code 39



indicates Pb-free Products.

【EXAMPLE OF LOT NO. MARKING】



【ATTENTION POINTS IN HANDLING】

Visual light emitting diode does not contain reinforcement materials such as glass fillers.
 Therefore if sudden thermal and mechanical shock are given, destruction or inferiority of luminous intensity may occur. Please take care of the handling.

■ FIXATION METHOD

1. ATTENTION POINTS

1-1) Please do not give excessive heat over storage temperature to resin.

However, In case that the product has to be heated in oven for the glue fixing, it can stand under (125°C MAX, 120sec MAX) condition.

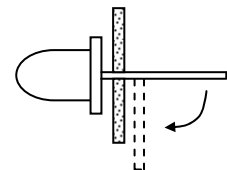
1-2) Please avoid stress to resin at high temperature.

2. TERMINATION PROCESSING

2-1) In case of termination processing, please fix the termination processing position, and process the reverse side of LED body.
 Please process before soldering.

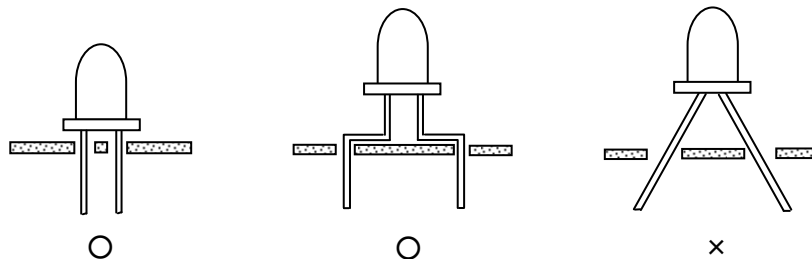
If stress is given during processing, It may cause non-lighting failure.

To be fixed



3. ASSEMBLY ON PC BOARD

3-1) In case of soldering on PCB, If the operation is done with stress, it may cause non-lighting failure during soldering or using.

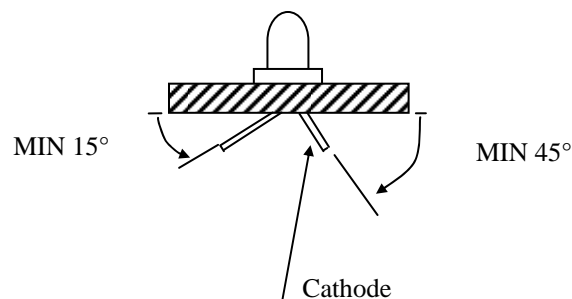


3-2) Therefore please design holes of PCB suitable for termination space or termination space after forming, and avoid the stress.

Especially in case of clinch to PCB, please do not leave remained stress.

Enough evaluation is requested before deciding assembly condition.

Please consult with us if any problems in the evaluation stage.



4.SOLDERING

4-1) Please make soldering rapidly under the following temperature and time conditions.

4-2) Please avoid stress to LED lamp during soldering.

4-3) Recommendable soldering conditions are as follows:

ARTICLE		SOLDERING TEMP	OPERATION TIME
Soldering Dip	Preheat	Max. 100°C	Max. 60sec
	Soldering Bath	Max. 265°C	Max. 5sec
Soldering Iron		Max. 400°C	Max. 3sec

5.CLEANING

5-1) In case of cleaning, some solvents may cause damage of resin or cause non-lighting failure, so please check the solvent before actual use. The recommendable cleaning solvent is alcoholic one such as isopropyl alcohol.

RECOMMENDABLE CLEANING CONDITIONS

METHOD	CONDITIONS
Cleaning by solvent	Temperature of solvent : Max. 45°C Immersion time : Max. 3min
Cleaning by ultrasonic	Ultrasonic out : Max. 15W/Liter Cleaning time : Max. 3min

■ ATTENTION ON STORAGING

Storage in dry box is most desirable, but if it is not possible, we recommend following conditions.

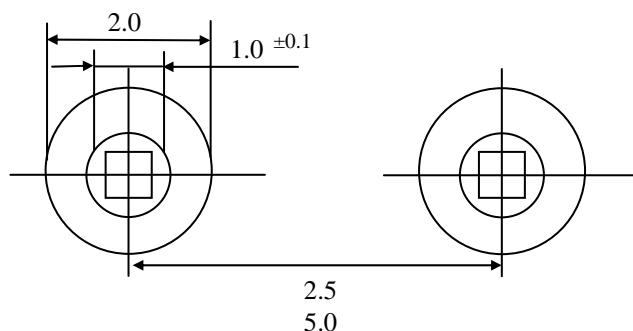
Temperature : 5 ~ 30°C

Humidity : Max. 60%

■ RECOMMENDABLE ROUND PATTERN

Round pattern depends on the material PCB, density and circuit arrangement.

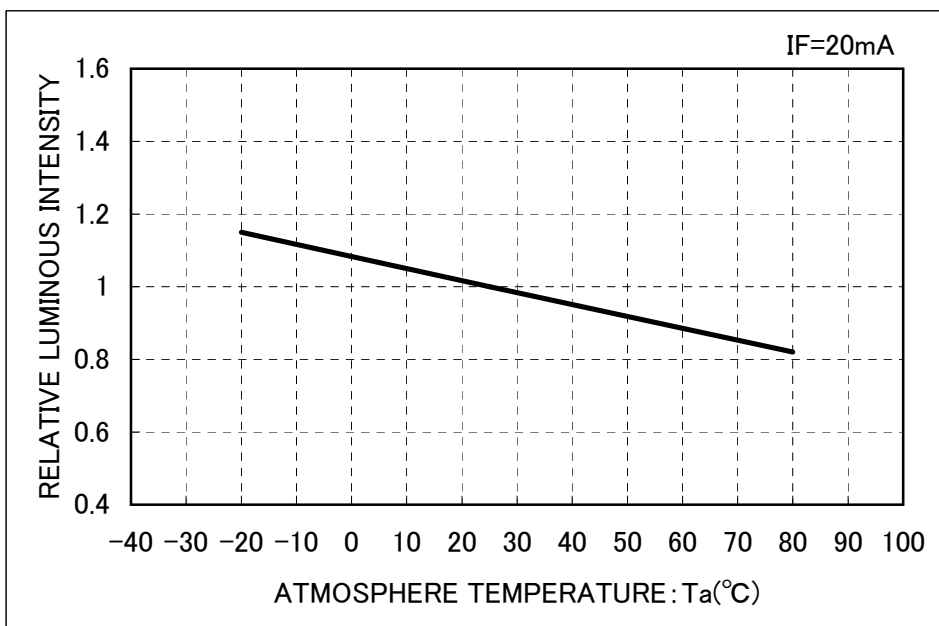
Our recommendation is as follow:



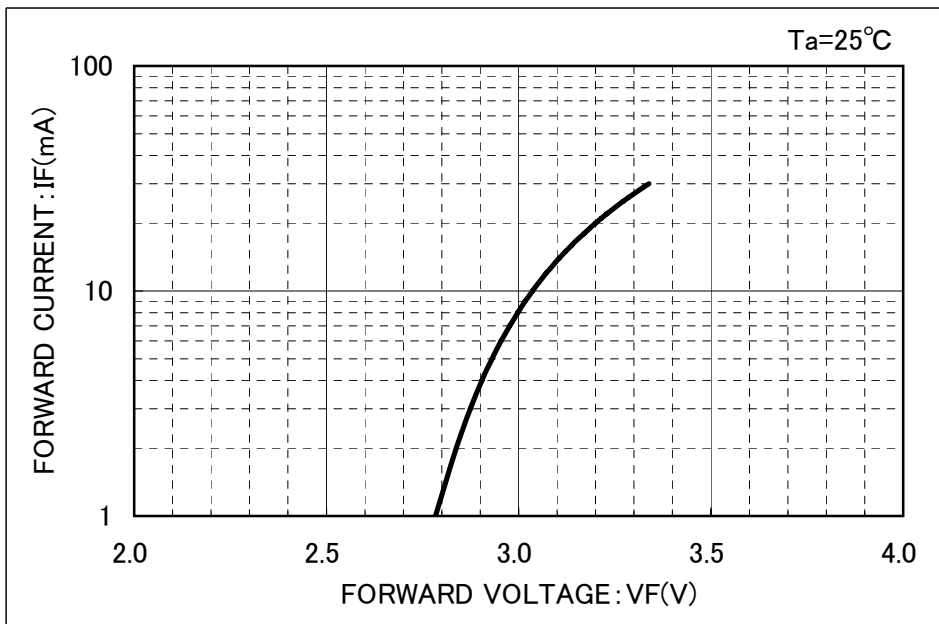
* Unit : mm

* Lead types : □0.4mm

RELATIVE LUMINOUS INTENSITY – ATMOSPHERE TEMPERATURE
光度 – 周囲温度特性

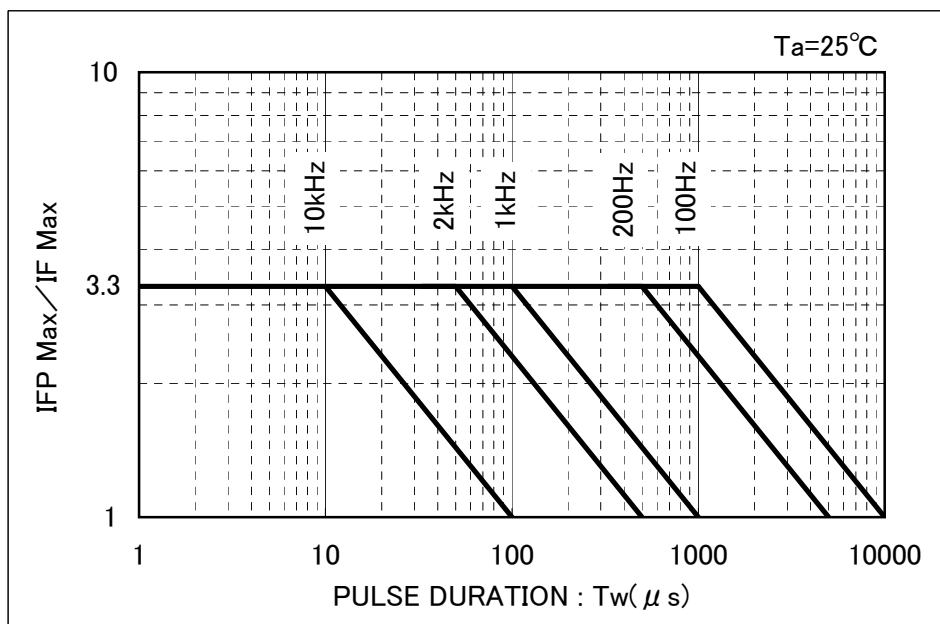


FORWARD CURRENT – FORWARD VOLTAGE
順方向電流 – 順方向電圧特性

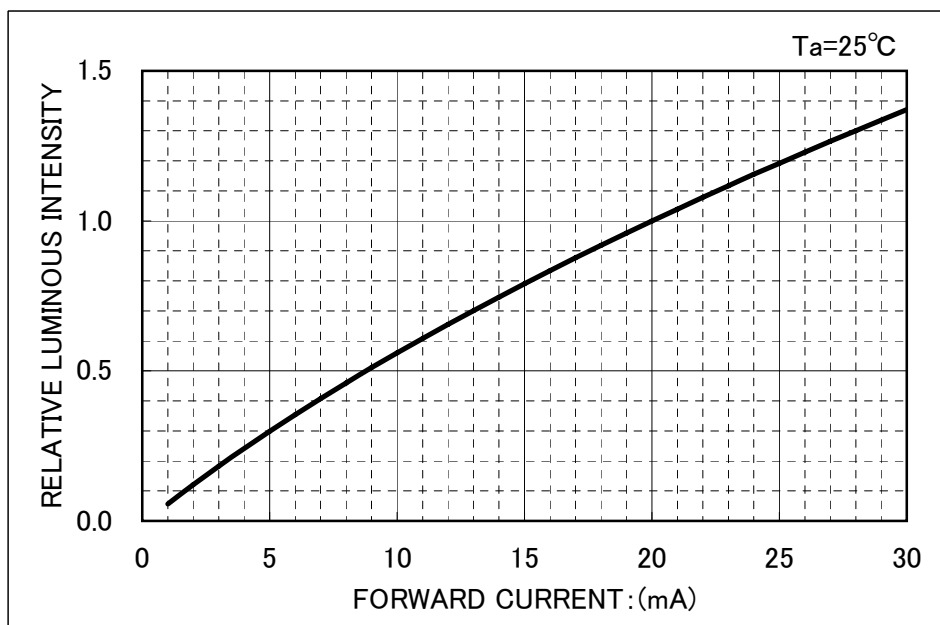


Reference

RATIO OF MAXIMUM TOLERABLE PEAK CURRENT – PULSE DURATION
最大許容ピーク電流 – パルス幅特性

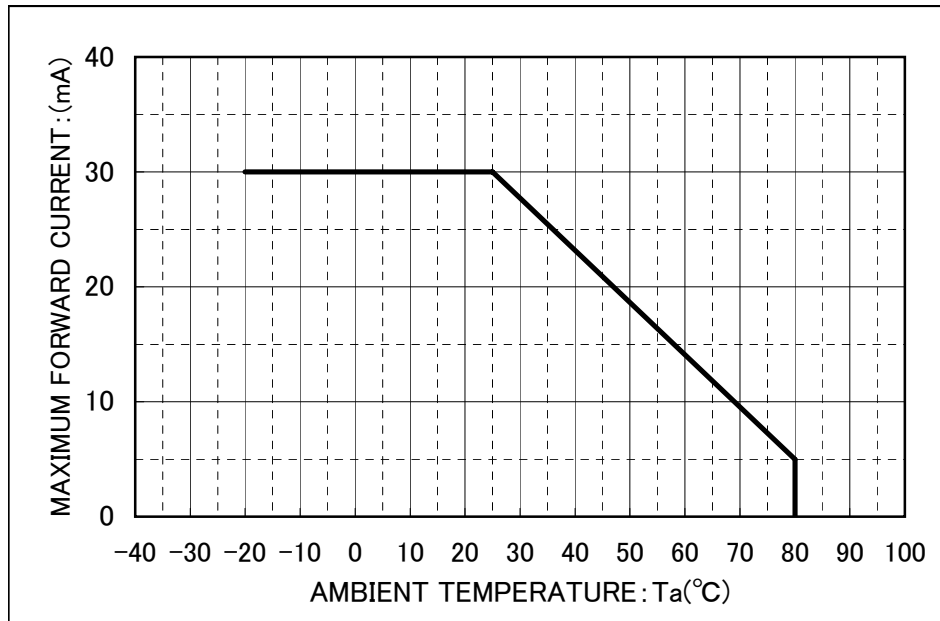


RELATIVE LUMINOUS INTENSITY – FORWARD CURRENT
光度 – 順方向電流特性

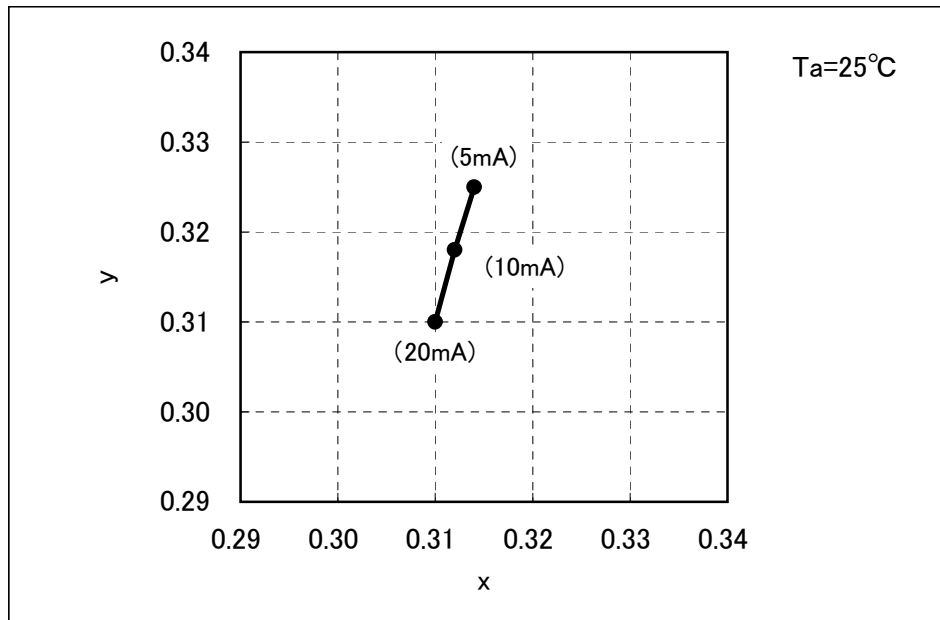


Reference

DERATING
ディレイティング特性



FORWARD CURRENT – CHROMATICITY DIAGRAM
順方向電流 – 色度図特性



Reference

RELATIVE LUMINOUS INTENSITY – VIEWING ANGLE
指向特性

